Master 10/100 Net

User Guide

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Overview:

The philosophy of the BBC Microcomputer series included the ability to network several computers together to allow expensive peripherals such as printers to be shared between several users - often in a classroom or small business environment.

This 'Econet' network was offered as an option on most machines, and in the case of the BBC Master series as a user installable plug in module.

Despite its robustness the majority of other computer vendors eventually adopted the Ethernet standard instead using variable length messages called Internet Protocol ('IP') packets.

The Master 10/100 net module allows the BBC Master series to be retrospectively upgraded to communicate with an Ethernet network, sharing peripherals and information with other personal computers.

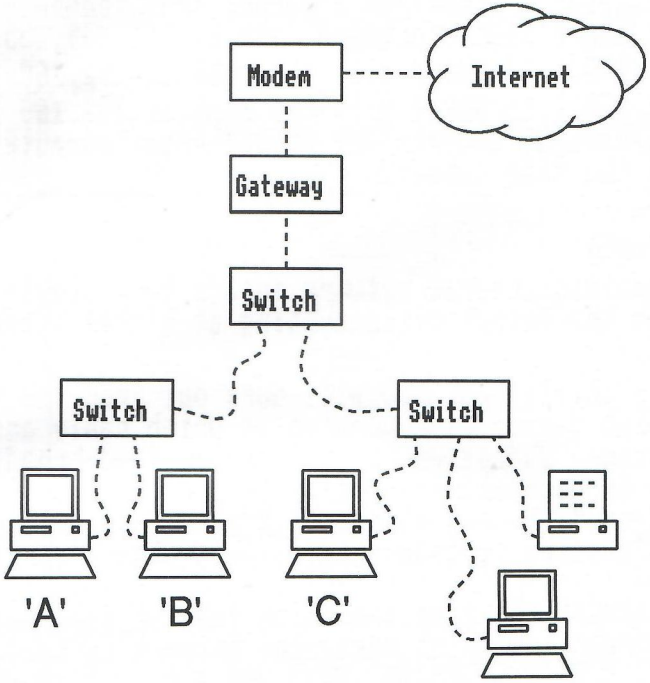
Specifications:

The board comes with the following features:

- 10Mbps or 100Mbps data transfers
- Automatic detection of crossover cables allowing two computers to be directly connected without needing a switch or hub
- Automatic negotiation of link options to minimise setup complexity
- Automatic network address setup to minimise setup complexity
- A total of 76kbyte of RAM for packet buffers to speed transfers
- 1kbyte of non volatile memory to save the network configuration
- Supporting software to share Windows harddisc space as a filing system, with network software upgradeable in the field
- Programmer access from BASIC to the network software

Simple Ethernet network introduction:

Ethernet networks can be made up of potentially many millions of computers which makes describing their general structure quite difficult. Fortunately most home networks are quite small and therefore easily understood.



This network of five devices has been made from the following building blocks:

- 4 computers with ethernet interfaces
- 1 networked printer shared between all users
- 3 switches
- A gateway
- A modem

Computers and printers -

Each device must be given a network address and a network mask, together these give the device a unique address. Normally the addresses are given as 4 numbers separated with dots to make them easier to read with each number being in the range 0-255 (ie. an 8 bit number).

To be able to talk to eachother all of these devices must be on the same sub network (subnet). A device considers a packet to have arrived from the same subnet when its network address ANDed with the network mask matches the one in the packet.

Imagine "computer A" receives a packet from "computer B", when both A and B have a network mask of 255.255.255.0.
Address 192.168.1.10 ANDed with the mask is 192.168.1.0
Address 192.168.1.11 ANDed with the mask is 192.168.1.0 also and so "computer A" accepts the packet from "computer B" as they are on the same subnet.

Switch (or hub) -

A switch combines several network inputs to a single network output, with the output often running at higher speed.

Switches are intelligent and will work out from the packets they see which device is connected to which cable and only send on messages addressed to that device (and broadcast packets too of course). This helps to reduce congestion on the network as "computer A" can talk to "computer B" without "computer C" having to hear them.

A hub does almost the same combining job but does not do the selective forwarding which means the network is more noisy.

Gateway -

One device on the subnet is nominated to be a gateway and has the job of forwarding messages not yet delivered to their final destination (normally to the internet, but could just be bridging to another differently numbered subnet).

Modem -

Originally meaning "modulator-demodulator" the modem is usually the last piece of equipment before the network data leaves the building. Depending on the services you subscribe to this might be an ADSL telephone line; a cable installation from your local provider; fibre optic; or dialup connection.

Many modems integrate a gateway and switch in the same box.

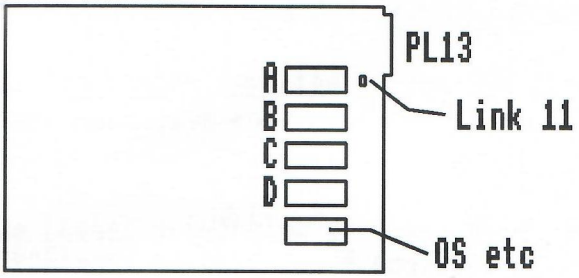
Fitting the network software:

With the machine turned off, remove the four lid fixing screws and take off the lid.

If there is an ANFS ROM fitted this must be removed by gently prising the chip out with a suitable IC removal tool.

Master Compact -

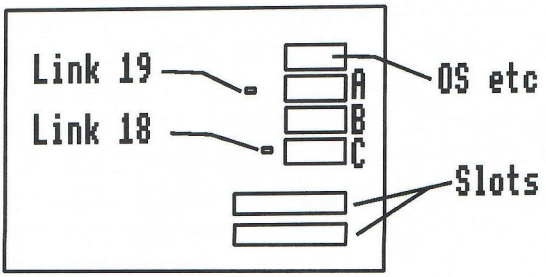
The sockets A, B, C, D are for ROMs. In order to use socket D



first move Link 11 to South, note any upgrades on PL13 will be disabled as a result of this so try to use A, B, C first.

Master and Master ET -

The sockets A, B, C are for ROMs, although only B is for a 16k chip, the others are normally sideways RAM which must be link deselected before they can be used as ROMs.



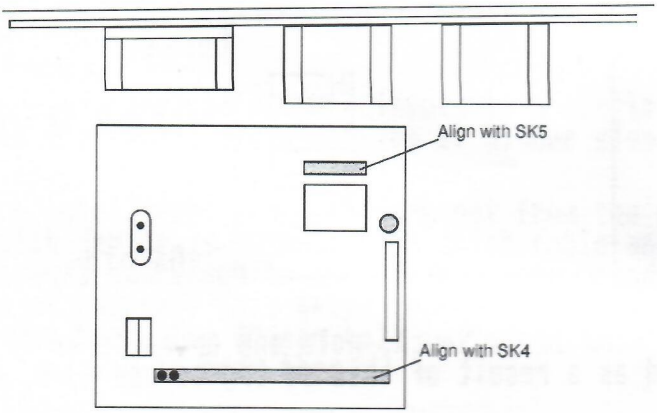
Use socket B if possible, or alter Link 19 to East to use A, or alter Link 18 to East to use C: this will however result in a loss of some sideways RAM.

Fitting the network module:

If there is already an Econet module installed this will first need to be removed and stored away safely. Any supporting pillars can be released by gently squeezing the top portion with pliers, and pulling upwards on the module.

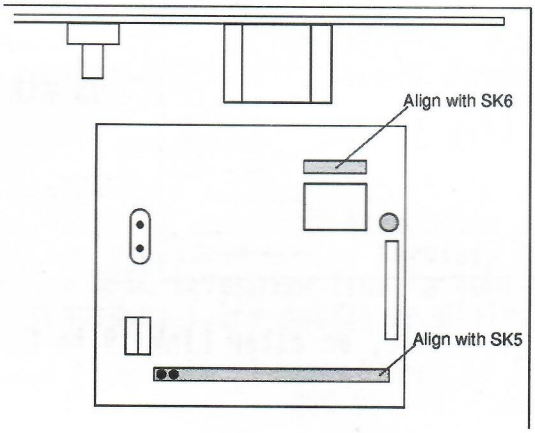
Master Compact -

Carefully line up and press in the pin mating headers with PL100 above SK5 and PL101 above SK4 on the motherboard.



Master and Master ET -

Carefully line up and press in the pin mating headers with PL100 above SK6 and PL101 above SK5 on the motherboard.



Configuring the network for the first time:

Replace the lid and fixing screws.

Connect the RJ45 to DIN cable to the socket labelled "Econet" at the rear of the case, plugging the plastic RJ45 connector into the rest of your Ethernet network equipment.

Turn the machine back on. Type

```
*ROMS
```

at the prompt and locate the ROM called "LANMANAGER". If this ROM is marked as "unplugged" it must also be enabled with

```
*INSERT <rom>
```

where <rom> is the number reported in the ROM listing.
Master ET owners must also type

```
*UNPLUG 14
*UNPLUG 10
```

to disable the Econet networking software which is part of the built in software as this could conflict with the Ethernet hardware.

By default the software will be set to configure the interface automatically, so a network using the dynamic host configuration protocol (DHCP) may need no further setup.

To see the current network configuration type

```
*HELP LANMANAGER
```

which will report the link status. This will be one of

- Not fitted
  There is a problem with the hardware installation.
- Down
  No link could be established, the network does not provide automatic addresses via DHCP, or there is a cable fault. Check the configuration instructions and correct any errors.
- Acquiring address
  An automatic address negotiation is in progress.
- Up
  A Link has been successfully established.

Testing the link:

Having established a link (either via automatic setup or via manual network configuration), it should now be possible to send packets to other devices on the same subnet.

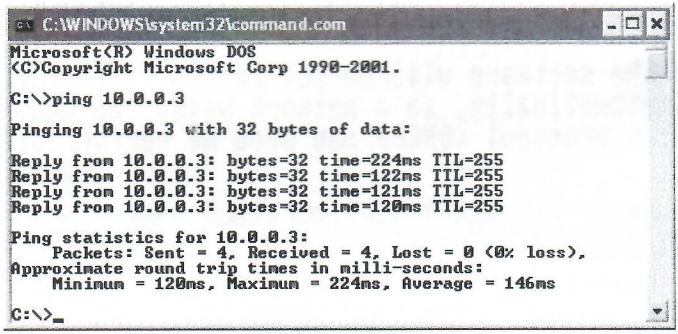
To discover which network address is being used by the network module, type

```
*EMINFO
```

and look for the address listed.

A dummy message to test the link should be sent using the program "ping" which is commonly available on other computers. In this example Microsoft Windows will be used.

Choose Start > Run... > command.com
to open a command prompt and type "ping" followed by the address, here the address 10.0.0.3 was assigned to the network module, substitute the address discovered above for your setup


C:\WINDOWS\system32\command.com
Microsoft(R) Windows DOS
(C)Copyright Microsoft Corp 1990-2001.
C:\>ping 10.0.0.3
Pinging 10.0.0.3 with 32 bytes of data:
Reply from 10.0.0.3: bytes=32 time=224ms TTL=255
Reply from 10.0.0.3: bytes=32 time=122ms TTL=255
Reply from 10.0.0.3: bytes=32 time=121ms TTL=255
Reply from 10.0.0.3: bytes=32 time=120ms TTL=255
Ping statistics for 10.0.0.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 120ms, Maximum = 224ms, Average = 146ms
C:\>

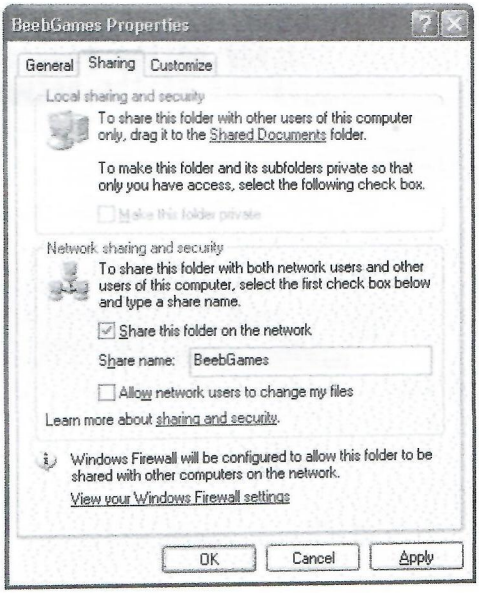
which is then contacted by Windows. If no reply is given (ie. the packet loss is reported as 100%) go back and check the cables and address configuration selected.

Sharing data with Microsoft Windows:

The 'Common Internet Filing System' was designed by Microsoft to allow different vendors to share files with eachother. The LANMANFS filing system supplied with the network module can be used to connect to other computers which also understand 'CIFS', such as Microsoft Windows.

To connect to a folder (or even the entire disc drive) on a remote Windows computer you must first enable sharing.

Choose the folder you wish to access over the network and right click on it, select the option "Sharing and Security..." which will open a dialogue box (it may look slightly different depending on the version of Windows being used):


BeebGames Properties
General
Sharing
Customize
Local sharing and security
To share this folder with other users of this computer only, drag it to the Shared Documents folder.
To make this folder and its subfolders private so that only you have access, select the following check box.
Make this folder private
Network sharing and security
To share this folder with both network users and other users of this computer, select the first check box below and type a share name.
Share this folder on the network
Share name:
BeebGames
Allow network users to change my files
Learn more about sharing and security.
Windows Firewall will be configured to allow this folder to be shared with other computers on the network.
View your Windows Firewall settings
OK
Cancel
Apply

In the section labelled "Network sharing and security" tick the option "Share this folder on the network".

By default the share name is the name of the folder that was clicked on, 'BeebGames' in this example, but this can be changed to something more memorable. Advanced users may also need to specify a username and password or workgroup if the

network settings have been customised - see the *MOUNT command described in the "New commands" section.

The other option, "Allow network users to change my files" makes the share writeable, without this any attempt to save files will receive a "Read only" error message.

On the Master, select the filing system using the command

*LANMAN

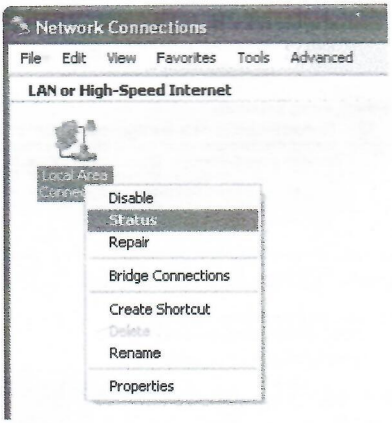
or pressing the shortcut 'L-BREAK' at reset. Next, connect to the shared folder on the remote computer with

*MOUNT \\OfficePC\BeebGames

remembering that in MODE7 the '\' key appears as a '£' symbol on screen. If the computer name is not known it is also possible to connect by network address

*MOUNT \\192.168.1.54\BeebGames

for example. The network address of the remote computer can be found by looking at the status of the network connection in Control Panel



It is now possible to list, load, and save files and directories just as though it was an ADFS or DFS disc drive.

When finished it is important to sign off from the share so that you do not lose any of your work, this is done with

*DISMOUNT

which closes the network connection and completes any network transmissions.

New commands (Networking):

Syntax: *EMINFO [-verbose]
Lists information on the network module's running state, a longer version of *HELP LANMANAGER.
The option '-verbose' also lists some counters which may be useful in diagnosing complicated network problems and can ordinarily be ignored.
Minimum abbreviation is *EMI.

Syntax: *EMTEST
Performs some hardware self tests and reports the result. The hardware is checked at power on and does not normally need to be tested manually.
Minimum abbreviation is *EMT.

Syntax: *HELP LANMANAGER
Reports the version of the networking software along with a summary of the network status.
Minimum abbreviation is *H.LANMANAGER

Syntax: *PING [-quiet] <address | name>
Sends dummy messages to the given address. If a domain name server is set up, or the address is in the hosts table (see "Advanced network configuration" for details of how to add entries to the hosts table) the remote computer's name can be used instead.
Press 'ESCAPE' to stop messages being sent.
The option '-quiet' will only print a summary when the 'ESCAPE' key is pressed.
Minimum abbreviation is *PI.

Syntax: *CONFIGURE EMLINK <Auto> | <10|100 [Half|Full]>
Sets the hardware link speed. Ordinarily this should be set to 'AUTO' and the network module will negotiate the best link with whatever it is plugged into.
Manually configuring it may mean that no link will be established if the link partner cannot support the chosen option(s), it also means that the network module can no longer detect and correct for cross wired cables.

```
        The link speed can be forced to 10Mbps or 100Mbps and
        half or full duplex, if the duplex is not specified
        full duplex will be assumed.
        Minimum abbreviation is *CONFIG.EMLINK
Syntax: *CONFIGURE EMADVERTISE [10 [Half] [Full]]
                               [100 [Half] [Full]]
        Sets the capabilities that are declared to anything
        that the network cable is plugged into.
        This can selectively declare a 10 or 100Mbps link
        with half or full duplex, if neither 'HALF' nor
        'FULL' is specified both will be advertised as
        though both 'HALF' and 'FULL' were selected, and
        at least one speed must be advertised.
        By only advertising a reduced set of capabilities
        the link rate can be reduced while allowing
        configuration option 'EMLINK' to be left as 'AUTO'.
        Minimum abbreviation is *CONFIG.EMADVERTISE
Syntax: *CONFIGURE EMADDR <Auto> | <D.D.D.D>
        Sets the IP address.
        Minimum abbreviation is *CONFIG.EMADDR
Syntax: *CONFIGURE EMMASK <Auto> | <D.D.D.D>
        Sets the network mask.
        Minimum abbreviation is *CONFIG.EMMASK
Syntax: *CONFIGURE GATEWAY <D.D.D.D>
        Sets the gateway address.
        Minimum abbreviation is *CONFIG.GATEWAY
Syntax: *CONFIGURE DNS <D.D.D.D> [D.D.D.D]
        Sets the domain name server address.
        Minimum abbreviation is *CONFIG.DNS
Syntax: *STATUS EMLINK
        Reports the current hardware link settings.
        Minimum abbreviation is *ST.EMLINK
Syntax: *STATUS EMADVERTISE
        Reports the current capabilities that will be
        advertised to devices plugged into the network cable.
        Minimum abbreviation is *ST.EMADVERTISE
Syntax: *STATUS EMADDR
        Reports the current network address settings.
```

```
        Minimum abbreviation is *ST.EMADDR
Syntax: *STATUS EMMASK
        Reports the current network mask settings.
        Minimum abbreviation is *ST.EMMASK
Syntax: *STATUS GATEWAY
        Reports the current gateway address settings.
        Minimum abbreviation is *ST.GATEWAY
Syntax: *STATUS DNS
        Reports the current DNS address settings.
        Minimum abbreviation is *ST.DNS
```

New commands (LANMANFS):

```
Syntax: *LANMAN
        Selects the Common Internet Filing System as the
        currently active filing system.
Syntax: *HELP
        Reports issues of the ROMs in your machine.
        Minimum abbreviation is *H.
Syntax: *HELP LANMANFS
        Reports the version of the filing system.
        Minimum abbreviation is *H.LANMANFS
Syntax: *SDISC <share> <username> <password> <workgroup>
        See command *MOUNT.
        Minimum abbreviation is *SDI.
Syntax: *ACCESS <afsp> <L|R|W>
        Set a file's attributes to be Locked/Readable/
        Writeable, though all files will always be readable
        Minimum abbreviation is *AC.
Syntax: *COPY <afsp> <:drive.directory>
        Copies one or more files to the given drive/dir pair.
        To make a duplicate of a file within the same
        directory use the *MOVE command built into the MOS.
Syntax: *WIPE <afsp>
        Delete files, prompting for confirmation for each
        Minimum abbreviation is *W.
Syntax: *DESTROY <afsp>
        Delete files, prompting for confirmation of the batch
```

```
        Minimum abbreviation is *DES.
Syntax: *DRIVE <drive#>
        This command is included only for compatibility with
        files transferred from the disc filing system.
        Minimum abbreviation is *DR.
Syntax: *DIR <:drive.directory>
        Set current directory
Syntax: *LIB <:drive.directory>
        Set current library. When a share is first mounted
        the library will be set to "Library1" if it exists
        otherwise the library will default to the root, "$".
Syntax: *MOUNT <share> <username> <password> <workgroup>
        Attempts to connect to the given share, which can
        then be referred to as drive 0. If the username or
        password is omitted an attempt will be made to
        use a guest account, guest accounts may have reduced
        functionality.
        Where the share to connect to is not in the default
        workgroup, this must be specified too.
        Minimum abbreviation is *MOU.
Syntax: *RENAME <oldfsp> <newfsp>
        Rename the given file or directory
        Minimum abbreviation is *REN.
Syntax: *DISMOUNT
        Flush any buffers to the currently mounted share
        Minimum abbreviation is *DISM.
Syntax: *FREE
        Show free space statistics
        Minimum abbreviation is *FR.
Syntax: *CDIR <directory>
        Create a directory
        Minimum abbreviation is *CD.
Syntax: *BYE
        See command *DISMOUNT
        Minimum abbreviation is *BYE
Syntax: *ENABLE
        Skips warnings before 'dangerous' commands
        Minimum abbreviation is *ENA.
```

Loss of data:

Note that a hard or power-on reset has the effect of immediately disconnecting from the remote computer, and any data that was not written by first DISMOUNTing it will probably be lost.

Compatibility:

This software is a complete filing system implementation, yet there are some key differences between LANMANFS and other filing systems available for the BBC:

The media title is the name of the shared drive, and cannot be changed.

Though drive numbers are not explicitly supported, they may be used for compatibility purposes. When specifying a drive, you must select drive '0'.

File attributes under LANMANFS are slightly different from those on Acorn filing systems so

- any 'System' or 'Hidden' files are reported as 'Locked' against deletion rather than being hidden
- all files are readable
- 'Read only' files are marked as not being writeable
- the 'Archive' attribute is ignored

By default access is set to local WR access when creating a new file.

When attempting to access a file from the network an attempt will be made to find a corresponding filename with ".inf" appended to it (for example "MYPROG" would have its attributes stored in "MYPROG.inf") which will be used to preserve the file's original load and execution addresses. Where no ".inf" file is found, or it cannot be read, default load/execution addresses will be substituted.

The 3 letter file extensions used by Windows must be separated by a '/' character rather than a '.' as this is used on the BBC to separate directories.

When a space is needed it must be introduced using the GSTrans notation (the same notation used to enter soft key definitions for *KEY), this is because many commands use a space to separate parameters.
Therefore, a filename shown in a directory listing as

```
My BASIC Program
```

would be loaded using

```
LOAD"My| BASIC| Program"
```

and likewise for the other available commands.
Only spaces may be introduced in this way, other GSTrans sequences will be faulted. Note: not all software uses GSTrans, so for example ViewSheet cannot be used with spaces in filenames at all.

Windows theoretically allows filenames up to 255 letters long, but these could not be manipulated on the BBC micro because several of the operating system interfaces assume that results will fit in one page (256 bytes) of memory. To get around this a sensible maximum of 26 characters is imposed by LANMANFS, any files with names longer than this will be unavailable.

The 'cycle number' does not increment with each write to the share, instead it is a 'number of files currently open' status byte, taking the value 0-3.
Up to 3 files may be open at once for any mixture of input, output, random access.
The SPOOL/EXEC files are not held open over a filing system change.

The only valid boot option for shared discs is zero (off).

One page (256 bytes) of memory is claimed as private workspace. This must not be tampered with.

Six pages (1536 bytes) of memory are claimed as shared workspace with other filing systems in the machine to use as buffers for the three open files.

The filing system id is 102 for LANMANFS.

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Portions of the network module use software from the excellent "Light weight internet protocol" stack which comes with the following notice:

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Error messages:

"No net address" - the operation could not complete as there is no network address set

"Out of range" - an unknown request was made to the network module software, which would suggest the ROM and network module software have incompatible versions running

"Aborted" - the operation was stopped due to a fatal error

"Can't extend" - the file could not be extended

"String too long" - the resulting text overflowed a buffer

"Bad command" - the syntax of the entered command is incorrect or an attempt was made to *RUN a file which does not exist

"Not found" - the requested file was not present on the share

"Bad option" - only OPT0, OPT1, OPT4 are allowed

"Channel" - a call was made with a handle which is either illegal or has already been closed

"Bad address" - when *LOADing the file a target address must be given

"Media full" - no free space was found for the operation

"Escape" - the user aborted something waiting for his input

"Host not known" - the machine name could not be found either in the hosts list nor by DNS

"No reply" - no connection exists to the machine

"Bad name" - the name given contained forbidden characters or was too long

"No!" - files with load address &FFFFFFxx cannot be run

"Bad drive" - a drive number other than 0 was used

"Read only" - an attempt was made to write to a file not open for writing

"Bad password" - a missing or incorrect password was given

"User not known" - a missing or incorrect user name was given

"Media changed" - data on the share has changed but has not yet been written back, use *DISMOUNT

"Not logged on" - the machine is on the network but has not yet accepted your credentials

"Access violation" - an attempt to perform an operation that

you do not have permission to do, such as reading from a write only file

"Too many open" - only 3 files may be open at once

"Server error" - the remote machine returned a non specific or undocumented error number

"Bad dir" - the directory specifier was invalid

"Exists" - renaming a file to the name of another file on the share is forbidden, similarly trying to create a directory that already exists

"Can't delete CSD" - an attempt was made to delete the current selected directory

"Locked" - an attempt to delete, rename, or overwrite a locked file was made

"Open" - an attempt to delete, rename, or overwrite a file that is in use by another program

"Dir not empty" - directories must be empty before deletion

"Is a dir" - this operation is not meaningful on a directory

"Outside file" - the file pointer cannot be set beyond the end of the file for files opened for reading only

"Bad attribute" - supported attributes are R, W, and L

"Resolver busy" - a request to resolve a host name is already in progress

"Bad call" - the 'Berkeley Sockets API' function call failed

"Capabilities don't match" - the LANMANFS could not mutually agree which protocol to use with the remote share

Enquiries:

Any enquiries should be made in writing to:

R.P.Sprowson,
1 Webster terrace,
Cambridge,
Cambridgeshire.
CB5 8PZ.

Address correct Nov 2015.

Technical information:

This information may be of interest to users who wish to work at a lower level with the network module or to understand it further:

Connector PL101 -

The west most two pins of this header (sometimes designated 'A' and 'B') are not connected and are for mechanical support only.

Manual address configuration -

When DHCP is not in use it will be necessary to configure the network addresses manually using the *CONFIGURE commands listed in the "New commands" section.

- EMADDR
  When set to 'AUTO' the software will use DHCP and the remaining 3 address settings will be ignored.
  Otherwise, set it to the IP address you require.
  Invalid settings stop the interface from working.
- EMMASK
  When set to 'AUTO' the software will deduce the required mask based on the EMADDR setting.
  Otherwise, set it to the network mask you require.
  Invalid settings stop the interface from working.
- GATEWAY
  Set this to the address of the gateway on your network, if omitted or invalid you will only be able to contact devices on the same subnet.
- DNS
  Set this to the primary domain name server for your network, if omitted or invalid you will have to refer to all devices on the network by number or enter each device as a host in the host table as described in the "Advanced network configuration" section.
  A secondary DNS may be given incase the primary one is not responding.

Advanced network configuration -

There are a number of additional network settings that are not available using *CONFIGURE as they are typically for advanced users only. To edit these settings, first select the LANMANFS as described in "New commands" earlier. Using the built in editor type

```
*EDIT Choices:Internet.Startup
```

which will load the complete configuration. The configuration file is central to the operation of the network module.

It allows comments starting with a '#' symbol
and parameters to be separated by one or more spaces
and use of characters in the range 32-126 only
and lines must end with a carriage return
and up to 80 character lines (including the line end)

The default configuration is set out in 4 sections, these are

- Interface configuration
  Settings relating to the network hardware.
- Network configuration
  Each of the settings as described in the "Manual address configuration" section.
- CIFS configuration
  LanManFS is a common internet filing system. Its settings store defaults used to allow the shorthand versions of commands such as *MOUNT to be used.
- Hosts
  A list of host names and corresponding network addresses to check before contacting the DNS. When the DNS is provided by your service provider it should only be necessary to add the hosts local to the current subnet. If you run a DNS for your local network too then this section should be left blank. An example host table for a network of three devices might look like

```
10.0.0.1  scoobydoo  # In Jack's bedroom
10.0.0.2  scrappydoo # In Mary's bedroom
10.0.0.99 epson      # Laser printer in the study
```

When editing is complete press 'F3-COPY-RETURN' to save the choices then hard reset with 'CTRL-BREAK'.

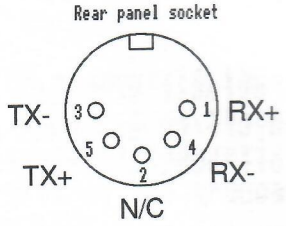
Machine code calls -

OSFile
  A=0 (save a section of memory) if this call fails due to lack of disc space and the <filename> given already existed, the result will be the truncation of <filename>
  A=1 (write cat info)
  A=2 (returns the object type only)
  A=3 (returns the object type only)
  A=4 (write attributes for an object)
  A=5 (read cat info)
  A=6 (delete given object)
  A=7 (create empty file)
  A=255 (load named file)
OSArgs
  Y=0 A=0 (read fs id)
  Y=0 A=1 (read address of *RUN parameters)
  Y=0 A=255 (update all files to media)
  Y=handle A=0 (read sequential pointer)
  Y=handle A=1 (write sequential pointer)
  Y=handle A=2 (read file length)
  Y=handle A=255 (update this file to media)
OSBGet
  Y=handle, byte returned in A is valid only if C=0
OSBPut
  Y=handle, A=byte to write
OSGbPb
  A=1, 2 (put bytes to media)
  A=3, 4 (get bytes from media)
  A=5 (read media title and boot option)
  A=6 (read device name and current dir)
  A=7 (read device name and current lib)
  A=8 (read names from current dir)
OSFind
  A=0 (close file, or files)

```
  A=&40 (openin an existing file)
  A=&80 (openout a file, deleting the old file if present)
  A=&C0 (openup an existing file)
OSFSControl
  A=0  (set option)
       X=0, Y=0 (reset default OPTions)
       X=1, Y=0/1 (turn off/on extended messages)
       X=4, Y=0 (turn off boot option)
  A=1  (test for EOF)
  A=2/3/4 (run the given file)
  A=5  (produce catalogue)
  A=6  (shut down filing system)
  A=7  (return handle range)
  A=8  (command about to be executed)
  A=9  (do a *EX)
  A=10 (do a *INFO)
OSWord
  A=&C0 (perform Berkeley Sockets API operation)
        On entry
        YX+0   = send block length (depends on subreason)
        YX+1   = return block length (depends on subreason)
        YX+2   = subreason code
        YX+3   = must be zero
        YX+4...= as required by the subreason code
        On exit
        YX+2   = zero
        YX+3   = error code, or unchanged for success
        YX+4...= updated if applicable dependant on the
                 subreason code
        Full details of the subreason codes are beyond the
        scope of this manual, but are available in the
        separate 'Network programming information' manual.
```

Network cable pinout -

Only four pins are used on the former Econet socket at the rear of the computer. These pins are wired as shown below.



Power supply requirements -

The network module is powered from the BBC Master power supply using pins on PL101. It has its own onboard 1.8V and 3.3V regulator to drive the network hardware.

Voltage: 5V ±10%
Current: 60mA max when not configured
180mA max when active at 100Mbps

Startup configuration file -

The pseudo file "Choices:Internet.Startup" is actually held inside a non volatile memory chip on the network module. The LANMANFS will divert a limited subset of OSFile operations (only) to the non volatile memory instead of to the network.

OSFile
A=0 (save a section of memory) the file replaces the original configuration, each line must be no more than 80 bytes long including the carriage return, which is checked, though the text itself is not checked for valid syntax in any way
A=1 (returns the object type only)
A=2 (returns the object type only)
A=3 (returns the object type only)
A=4 (returns the object type only)
A=5 (read cat info)
A=6 (operation 'delete' ignored)
A=7 (operation 'create' ignored)
A=255 (load named file, using given address only)